

Building NOAA's Environmental Real-time Observation Network

Site Maintenance Plan Appendices May, 2006

Draft 20060523

Appendix A. Precipitation Gauge Antifreeze Guide

This appendix explains the procedures for winterizing the GEONOR precipitation gauge. Table A-2 below, which is based on CRN's "USCRN Site Anti-Freeze Table" lists the amount of antifreeze to use, the date to add the antifreeze in the fall, the date to remove the antifreeze in the spring, and estimates of the number of times a gauge will have to be emptied, the amount of antifreeze and oil needed, and the amount of water/antifreeze waste generated per winter for a single gauge for each climate division in the New England states. The table will soon be updated to include all of the climate divisions in the contiguous United States.

Table A-2 is organized by state and then climate division within each state. The following bullet points describe the meaning and use of each column.

- "Add Mixture Date" is the date in the fall when antifreeze should be added and corresponds to the date with a 10 percent probability of the temperature falling to 28° F or less at an earlier date.
- "Remove Mixture Date" is the date in the spring when antifreeze should be removed and corresponds to the date with a 10 percent probability of the temperature falling to 28° F or less at a later date.
- "Amount to Add" is the amount of the antifreeze mixture, in liters or quarts, to add during the winter period between the add and remove dates. The amounts are determined based on the record minimum temperature for each climate division, following GEONOR's recommendations, reproduced in Table A-1 below:

Table A-1. GEONOR antifreeze amount recommendations based on record minimum temperature.

Temperature		Amount of Antifreeze (L)	Amount of Antifreeze (Qt)	Temperature		Amount of Antifreeze (L)	Amount of Antifreeze (Qt)
23° F	-5° C	1.5	1.6	-13° F	-25° C	5.0	5.3
14° F	-10° C	2.6	2.7	-22° F	-30° C	5.6	5.9
5° F	-15° C	3.6	3.8	-31° F	-35° C	6.0	6.3
-4° F	-20° C	4.2	4.4				

NOTE: The antifreeze to be used is propylene glycol.

- "Normal Winter Precip" is the normal liquid equivalent precipitation for the climate region from the add date to the remove date, in inches.
- "Vol Equiv." is the volume equivalent of the normal winter precipitation for the GEONOR precipitation gauge in quarts. This is the number of quarts of liquid that will be collected in the gauge if the normal winter precipitation falls. This is used as a guide in estimating the number of times that the gauge must be emptied between the add and remove dates.
- "Number of Fills" is the number of times that the bucket must be filled with antifreeze from the add date to the remove date and corresponds to the number of times that the gauge must be emptied, as well. This number was calculated by multiplying the normal winter precipitation by 1.5 to allow for abnormalities, dividing by the amount of precipitation in one collection period, and rounding up to the next whole number. The bucket is assumed to be emptied when 75% full

(9 liters/9.5 quarts), so the amount of precipitation in one collection period is 9.5 quarts minus the amount of antifreeze added.

- “Yearly Req. (Qts)” is the total estimated amount of antifreeze required per winter in quarts. It is equal to the amount of antifreeze required multiplied by the number of times filled.
- “Yearly Req. (Gal)” is the total estimated amount of antifreeze required per winter in gallons.
- “Total Waste” is the total estimated amount of waste mixture removed from the gauge per winter in gallons. It is equal to the normal winter precipitation multiplied by 1.5 plus the estimated yearly amount of antifreeze required.

The figures on the pages following Table A-2 are maps showing the locations of the climate divisions and their relation with county boundaries. The maps will allow the determination of the climate division in which each National Cooperative Mesonet station is located.

Table A-2. Precipitation gauge antifreeze table.

State	Climate Division Number	Climate Division Name	Add Mixture Date	Remove Mixture Date	Amount to Add (L)	Amount to Add (Qt.)	Normal Winter Precip (in.)	Vol Equiv. (Qt.)	Number of Fills	Yearly Req. (Qt.)	Yearly Req. (Gal)	Total Waste (Gal)
CT	1	Northwest	15-Sep	15-May	6.0	6.3	32.36	17.4	8	52.1	13.0	19.5
CT	2	Central	1-Oct	15-May	6.0	6.3	31.76	17.0	8	51.1	12.8	19.2
CT	3	Coastal	1-Oct	15-May	5.6	5.9	30.40	16.3	7	40.3	10.1	16.2
ME	1	Northern	1-Sep	15-Jun	6.0	6.3	29.73	16.0	8	47.9	12.0	18.0
ME	2	Southern Interior	15-Sep	1-Jun	6.0	6.3	31.52	16.9	8	50.8	12.7	19.0
ME	3	Coastal	15-Sep	1-Jun	6.0	6.3	36.51	19.6	9	58.8	14.7	22.0
MA	1	Western	15-Sep	1-Jun	6.0	6.3	34.82	18.7	9	56.1	14.0	21.0
MA	2	Central	15-Sep	1-Jun	6.0	6.3	33.79	18.1	9	54.4	13.6	20.4
MA	3	Coastal	1-Oct	15-May	5.6	5.9	30.88	16.6	7	41.0	10.2	16.5
NH	1	Northern	1-Sep	15-Jun	6.0	6.3	31.66	17.0	8	51.0	12.7	19.1
NH	2	Southern	15-Sep	1-Jun	6.0	6.3	30.81	16.5	8	49.6	12.4	18.6
NY	1	Western Plateau	1-Sep	15-Jun	6.0	6.3	29.84	16.0	8	48.1	12.0	18.0
NY	2	Eastern Plateau	15-Sep	1-Jun	6.0	6.3	29.93	16.1	8	48.2	12.0	18.1
NY	3	Northern Plateau	1-Sep	15-Jun	6.0	6.3	35.37	19.0	9	57.0	14.2	21.4
NY	4	Coastal	1-Oct	1-May	5.6	5.9	27.60	14.8	6	36.6	9.2	14.7
NY	5	Hudson Valley	15-Sep	1-Jun	6.0	6.3	30.26	16.2	8	48.7	12.2	18.3
NY	6	Mohawk Valley	15-Sep	1-Jun	6.0	6.3	31.05	16.7	8	50.0	12.5	18.8
NY	7	Champlain Valley	1-Sep	15-Jun	6.0	6.3	26.72	14.3	7	43.0	10.8	16.1
NY	8	St. Lawrence Valley	15-Sep	1-Jun	6.0	6.3	24.37	13.1	6	39.2	9.8	14.7
NY	9	Great Lakes	1-Oct	1-Jun	6.0	6.3	24.87	13.4	6	40.1	10.0	15.0
NY	10	Central Lakes	15-Sep	1-Jun	6.0	6.3	23.60	12.7	6	38.0	9.5	14.3
RI	1	Rhode Island	15-Sep	15-May	5.6	5.9	33.51	18.0	8	44.4	11.1	17.9
VT	1	Northeastern	1-Sep	1-Jun	6.0	6.3	30.97	16.6	8	49.9	12.5	18.7
VT	2	Western	1-Sep	1-Jun	6.0	6.3	26.95	14.5	7	43.4	10.9	16.3
VT	3	Southeastern	1-Sep	1-Jun	6.0	6.3	34.30	18.4	9	55.2	13.8	20.7



Figure A-1. Climate division and state boundaries for the contiguous United States.

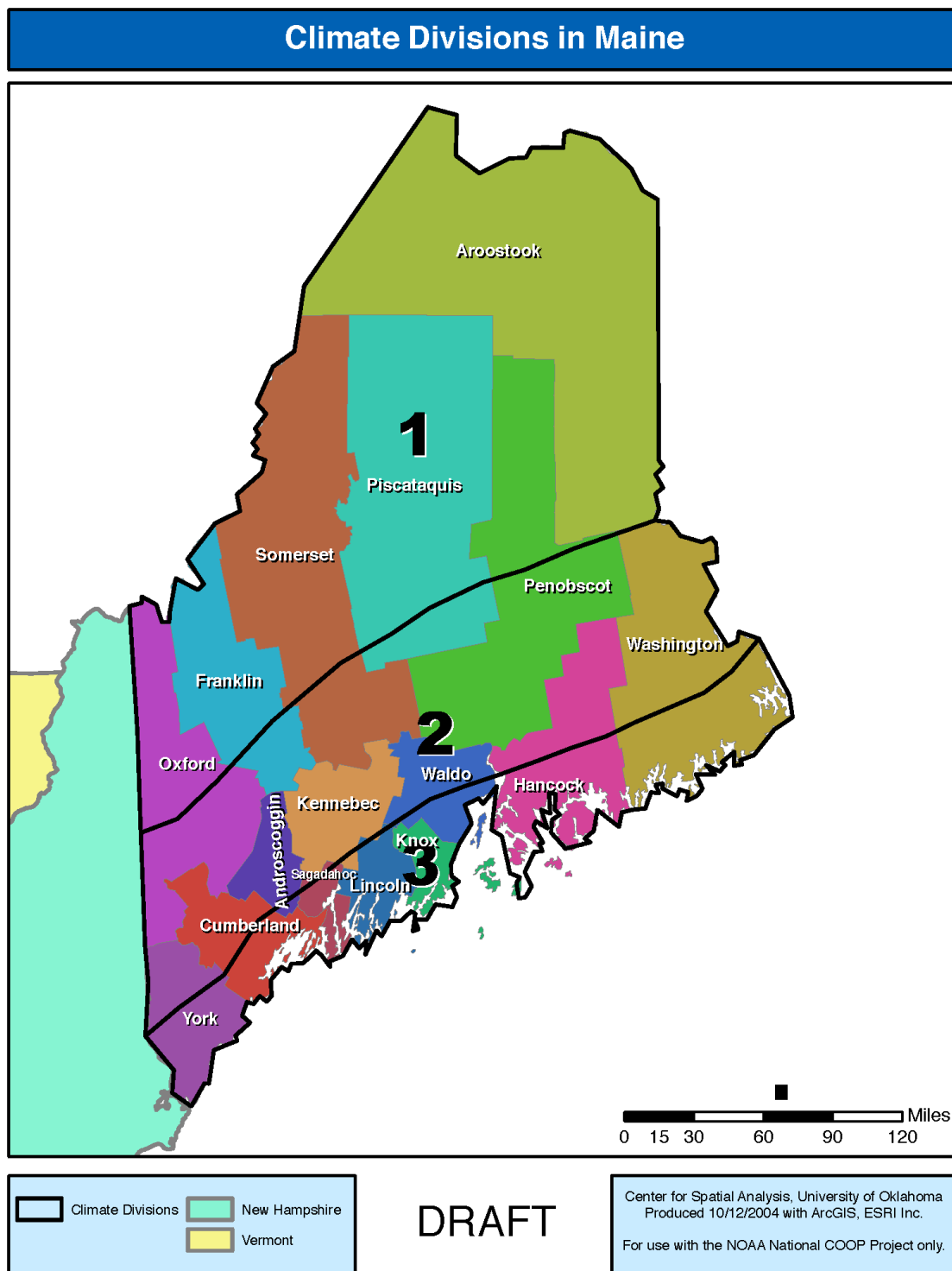
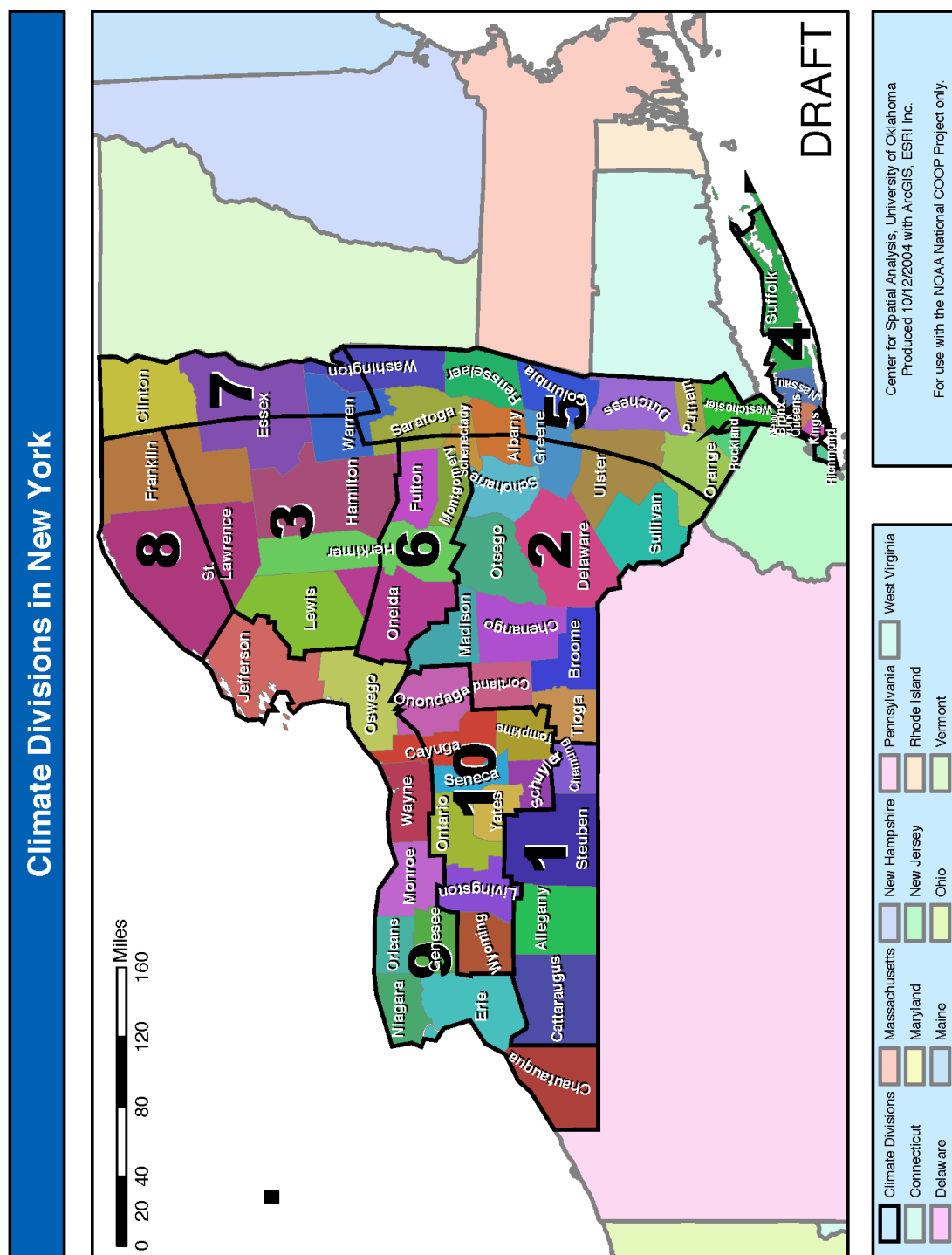


Figure A-2. Climate division and county boundaries in Maine.



Appendix B. Use of the Instrument Database

The instrument database is used to store and organize site metadata and to track sensors, equipment, and problems with equipment in the network. The database web interface is used to enter newly-acquired sensors and equipment, check sensors and equipment into and out of storage facilities, track sensor residence times (the number of months a sensor has resided at a specific site) for the purpose of scheduling sensor rotations, track problems in the network, and track recurring problems at specific sites or with specific sensors, and enter and track sensor calibration coefficients.

The database may be accessed at:

<http://www.isos.noaa.gov/admin/databases/metadb/>

A username and password are required to log on.

The sections beginning with B.2 describe how to perform some of the more commonly-used database tasks. In addition, the database has many more functions that may be useful. To learn more about them, click on the *Documentation* menu at the top of the web page.

B.1 Duties of Database Users

Each individual unit of equipment listed on the metadata form must be tracked in the instrument database by serial number from acquisition to decommissioning for use in NERON. Therefore, each person who handles tracked equipment by receiving it, moving it from one facility or station to another, calibrating it, or disposing of it when its useful life is complete must document each change in a unit of equipment's location, calibration, or operational status using the database web interface.

In addition, the database is used to submit trouble ticket problems and fixes and to submit documentation of each site visit. The following subsections list the database tasks for which each type of user is responsible. The duties marked with + bullets can only be performed by lead technicians and calibration lab managers.

B.1.1 Field and Lead Technicians

- Update equipment location information
- Enter site visit form information
- Enter new trouble ticket problems discovered during site visits
- Enter trouble ticket fixes
- Track trouble tickets issued for the stations under their responsibility to ensure that all problems are fixed within the fix deadline time limits specified in the Site Maintenance Plan.
- Track sensor residence times for the stations under their responsibility to ensure that all sensors are rotated at the intervals specified in the Site Maintenance Plan.
- + Insert new inventory received directly from an equipment vendor
- + Decommission equipment that is no longer usable

B.1.2 Calibration Lab Technicians and Managers

- Enter calibration coefficients associated with specific sensors
- Update equipment location information
- Track recurring problems with specific sensors
- + Insert new inventory received directly from an equipment vendor
- + Decommission equipment that is no longer usable

B.1.3 Inventory Managers

- Update equipment location information
- Track recurring problems with specific sensors and equipment
- Insert new inventory received directly from an equipment vendor
- Decommission equipment that is no longer usable

B.2 Viewing Site Metadata

1. Click on the *Network* menu at the top of the page and select *Site Summary*.
2. Select the network and site from the drop-down menus at the top left corner of the pane that appears.

B.3 Inserting New Equipment

1. Click on the *Equipment* menu at the top of the page and select *Insert Inventory*. The inventory insertion page will appear.
2. *Instrument vs. Non-Instrument*: Select whether the equipment is an instrument (i.e., measures meteorological parameters) or is a non-instrument.
3. *Serno*: Enter the equipment serial number. Enter the serial number exactly as printed on the unit of equipment, including all leading zeros and letters.
4. Click the *Add* button to enter the serial number in the list of serial numbers to be added to the database.
5. Repeat Steps 3 and 4 if inserting multiple units of equipment at the same time for which all information except the serial number is identical.
6. *Eqtype*: Select the equipment type from the drop-down menu.
7. *Model*: After the *Eqtype* is selected, a drop-down menu will appear next to *Model*, containing all available models for the *Eqtype* selected. Select the equipment's model number.
8. *Owner*: Enter the name of the organization that owns the equipment (e.g., "NWS" for National Weather Service, "NCDC" for National Climatic Data Center).
9. *Owner ID*: If the owner of the equipment has affixed a property ID tag the equipment, enter the property ID number in this field. Otherwise, leave it blank.
10. *Manufacturer*: Select the equipment manufacturer from the drop-down menu. If the manufacturer is not listed, click the *Manufacturer* label, enter the manufacturer name in the box of the window that pops up, and click *Insert*.

11. *Vendor*: Select the equipment vendor from the drop-down menu. If the vendor is not listed, click the *Vendor* label, enter the Vendor name in the box of the window that pops up, and click *Insert*.
12. *Cost*: Enter the cost of the equipment. If unknown, contact the person who made the purchase.
13. *Date Received*: Enter the date the equipment was first received. The date and time must be entered in one of the following two formats: DD-MMM-YYYY hh:mm or YYYY-MM-DD hh:mm, where MMM is the first three letters of the month, and MM is the number of the month. (e.g., 01 for January, 07 for July, etc.). The time is optional.
14. *Received By*: Select the affiliation of the person who initially received the equipment in the left-hand drop-down menu. Select the username of the person who initially received the equipment in the right-hand drop-down menu.
15. *Commission Date*: Enter the date on which the equipment was first field-ready. For non-instruments, this will typically match the *Date Received*. For instruments requiring lab calibration, enter the date on which the instrument first passed calibration.
16. *Commission Comment*: Enter any pertinent information, such as the area of the country for which the equipment is destined or if the equipment was acquired for a special use or project.
17. *Initial Location*: If received by a lab or facility, select Lab in the left-hand drop-down menu and select the lab/facility's ID in the right-hand drop-down menu. If received by a technician not based at a lab/facility, select the technician's affiliation in the left-hand drop-down menu and the technician's username in the right-hand drop-down menu.
18. *Date*: This field is automatically filled with the *Date Received* from above. Leave it as entered.
19. *Handler*: This field is automatically filled with the person listed in the *Received By* field above. Leave it as entered.
20. *Comment*: Enter the same text entered in the *Commission Comment* box. If there are any additional comments about the equipment's initial location, add them in this box.
21. Click the *Insert* button to insert the equipment into the database.

B.4 Decommissioning Equipment

1. Click on the *Equipment* menu and select *Search*. The equipment search screen will appear.
3. Enter the equipment's serial number in the *Serno* field.
4. Select the equipment's equipment type from the *Eqtype* list.
5. Click the *Search* button. If the serial number and equipment type were entered correctly and the equipment is entered in the database, it will be listed in the results box at the bottom of the window.
6. Click on the equipment's entry in the results window to bring up a window with the metadata on that sensor.
7. Click on the *Location* tab in the middle of the window.
8. Click on the *Insert Location* link in the upper right corner of the *Location* box. A pop-up window will appear with the location insertion form.

9. *Location*: Select *Lab* in the drop-down menu. In the second drop-down menu that appears, select *RETIRED*.
10. *Date Time*: Enter the date and time at which the decommissioning is effective. The date and time must be entered in one of the following two formats: DD-MMM-YYYY hh:mm or YYYY-MM-DD hh:mm, where MMM is the first three letters of the month, and MM is the number of the month. (e.g., 01 for January, 07 for July, etc.).
11. *Comment*: Enter “Decommissioned” and a brief explanation of how the equipment was disposed of.
12. *Handler*: Enter the affiliation and username of the person decommissioning the equipment.
13. Click the *Insert* button.
14. Click on the *Edit* link at the top right corner of the equipment metadata window.
15. *Retirement Date*: Enter the date and time at which the decommissioning is effective.
16. *Retirement Comment*: Enter the reason for decommissioning the equipment and how it will be or has been disposed of.
17. Click the *Submit* button.

B.5 Updating Equipment Location Information

Equipment locations must be updated any time equipment is transferred from one person to another, from a person to a facility or vice versa, or from a person to a vendor/manufacturer or vice versa. This procedure does not apply to installing or removing equipment from a site because equipment locations are automatically updated when entering trouble ticket fixes documenting installations and/or removals.

1. Click on the *Equipment* menu at the top of the page and select *Transfer*. If receiving or sending multiple items from or to the same location at once, select *Mass Transfer*.
2. Enter the serial number and equipment type of each unit of equipment.
3. If entering transfer information for a transfer that occurred in the past, enter the date and time in the *Date Time* field. The date and time must be entered in one of the following two formats: DD-MMM-YYYY hh:mm or YYYY-MM-DD hh:mm, where MMM is the first three letters of the month, and MM is the number of the month. (e.g., 01 for January, 07 for July, etc.). If entering the transfer information at the time the transfer is made, leave the field at its default value because the current date and time are automatically filled in.
4. In the *Handler* field, select yourself. This is the person actually entering the information into the database, even if not the person sending or receiving the equipment. If receiving equipment at or shipping equipment from a lab or facility, the *Handler* field indicates the person who received or shipped the equipment at the lab or facility, while the *To* or *From* field, respectively, indicates the name of the lab or facility.
5. The following two sub-sections explain what to enter in the *From*, *To*, and *Comment* fields, when receiving or sending equipment.

B.5.1 Receiving Equipment

6. If receiving equipment as a shipment, select *Transit* in the first *From* drop-down menu. In the second drop-down menu that appears, select *TO_TECH* if you are a field technician, otherwise, if you are located at a lab or facility, select the *TO_* category with the ID for your facility (e.g., if receiving equipment at NOAA's Atmospheric Turbulence and Diffusion Division (ATDD), select *TO_ATDD*).
7. If receiving equipment directly from another person, select that person's affiliation in the first *From* drop-down menu. Select the person's username in the second drop-down menu that appears.
8. If receiving equipment directly from a lab or facility (i.e., physically receiving it in person), select Lab in the first *From* drop-down menu. Select the lab or facility's ID in the second drop-down menu that appears.
9. If the person receiving the equipment is a field technician, select the receiver's affiliation in the *To* drop-down menu. Select the receiver's username in the second drop-down menu that appears.
10. If the person receiving the equipment is receiving it at a lab or facility, select Lab in the *To* drop-down menu. Select the lab or facility's ID in the second drop-down menu that appears.
11. *Comment:* If receiving a shipment, indicate the name of the lab/facility or the person who shipped the equipment. Enter any other pertinent information about the equipment, such as the reason it was sent or if it was received damaged.
12. When all information is entered, click the Insert button. The database will enter the information or display an error message if the entered location is inconsistent with a unit of equipment's location history. Re-check equipment serial numbers, equipment types, and dates to resolve the problem yourself. If unable to resolve it yourself, contact a NERON QA Manager by email or phone.

B.5.2 Sending Equipment

6. If the person sending the equipment is a field technician, select the sender's affiliation in the *From* drop-down menu. Select the sender's username in the second drop-down menu that appears.
7. If the person sending the equipment is sending it from a lab or facility, select Lab in the *From* drop-down menu. Select the lab or facility's ID in the second drop-down menu that appears.
8. If sending equipment as a shipment, select *Transit* in the first *To* drop-down menu. In the second drop-down menu that appears, select *TO_TECH* if shipping to a field technician, otherwise, if shipping to a lab or facility, select the *TO_* category with the ID for the facility (e.g., if sending equipment to NOAA's Atmospheric Turbulence and Diffusion Division (ATDD), select *TO_ATDD*).
9. If transferring equipment directly to another person, select that person's affiliation in the first *To* drop-down menu. Select the person's username in the second drop-down menu that appears.

10. *Comment*: If shipping equipment, indicate the name of the lab/facility or the person to which the equipment is addressed and enter the name of the shipping company and the tracking number. Enter any other pertinent information about the equipment, such as the reason it is being sent.
11. When all information is entered, click the Insert button. The database will enter the information or display an error message if the entered location is inconsistent with a unit of equipment's location history. Re-check equipment serial numbers, equipment types, and dates to resolve the problem yourself. If unable to resolve it yourself, contact a NERON QA Manager by email or phone.

B.6 Entering Site Visit Information

1. Click on the *Network/Site* menu and select *Site Visit*.
2. In the blank drop-down menu that appears at the upper right corner of the screen, select the network in which the site visited is located (e.g., select "COOPNE" for a site in New England).
3. In the drop-down menu that appears directly below the first, select the ID of the site visited. Click the *Insert Site Visit Form* link. The site visit form will appear, with the station ID filled in.
4. *Technician*: Select the technician's affiliation from the drop-down menu. Then select the technician's username from the right-hand drop-down menu that appears.
5. *Visit Type*: Select the primary reason for the visit from the drop-down menu.
6. *Date Time Arr*: Enter the date and time of arrival at the site. The date and time must be entered in one of the following two formats: DD-MMM-YYYY hh:mm or YYYY-MM-DD hh:mm, where MMM is the first three letters of the month, and MM is the number of the month. (e.g., 01 for January, 07 for July, etc.). The arrival time should be the time at which the technician first set foot inside the site plot, rounded back to the previous even five-minute time.
7. *Date Time Dep*: Enter the date and time of departure from the site. The departure time should be the time at which the technician last left the site plot, rounded forward to the next even five-minute time.
8. *Date Time Sub*: The current date and time are automatically entered as the submission time. Leave this as entered.
9. *Equip Inspection/Abnormality*: Select the appropriate entry for each category. Every drop-down must have a selection.
10. *Cleaning/Leveling*: Select the appropriate entry for each category. Select *N/A* if the equipment is not installed at the site. Every drop-down must have a selection.
11. *RF Power*: If the radio-antenna system forward and reflected power were checked, list the arrival and departure values. Select whether the power is entered in Watts or dBm.
12. Indicate whether or not the vegetation was cut.
13. Indicate whether or not the logger enclosure desiccant was replaced.
14. Indicate whether or not the precipitation gauge bucket was emptied. If so, in the line just below, indicated whether or not antifreeze was added, and if so, what type, the amount of antifreeze added, and how much water was mixed in with the antifreeze.

15. Indicate whether or not the precipitation gauge calibration was verified. If so, complete the *Cal Verif* fields. The percentage differences will be automatically calculated.
16. Indicate whether or not the precipitation gauge was calibrated.
17. Indicate whether or not the precipitation gauge calibration forms were completed.
18. Indicate whether or not a new operating system was uploaded to the logger.
19. Indicate whether or not a new program was uploaded to the logger.
20. Datalogger information verification: Review the logger OS, program, and PakBus ID information listed for the site. If correct, select *Correct*; if unknown, select *Unknown*; if not correct, select *Not correct*. If *Not correct* is selected, an automated email window will pop up with a comment window. Note which information is incorrect and what the correct values should be. The QA staff will use that information to correct the data in the database. Click *Save Email* when finished.
21. Documentation Submitted: Indicate in each drop-down menu whether the listed documentation has been submitted or not. If a particular entry is not applicable (i.e., no photos were required to be taken, no data collected from the logger, no trouble tickets fixed or generated, or the precipitation gauge was not required to be calibrated), enter *N/A*.
22. *Notes*: Enter explanations of any abnormalities noted in the first section of the site visit form and describe any work completed not already covered by the site visit form.
23. Click *Submit*. If any required fields were not filled in, an error message will appear, listing each required field that was not filled in.

B.7 Entering a Trouble Ticket Problem

1. Click on the *Ticket* menu and select *Insert Problem*. The insertion form will appear.
2. *Ticket No.* field: The database automatically enters the next unused ticket number; leave the number as entered.
3. *Date Prob Noticed* field: Enter the date and time the problem was noticed. All dates must be entered using one of the two following formats: DD-MMM-YYYY hh:mm or YYYY-MM-DD hh:mm, where MMM is the first three letters of the month, and MM is the number of the month. (e.g., 01 for January, 07 for July, etc.).
4. *Date Entered* field: This field is automatically completed with the current date and time; leave it as entered.
5. *Entered By*: In the left-hand drop-down menu, select your affiliation. In the right-hand drop-down menu, select your username.
6. *Date Prob Traced* field: This field indicates the date and time at which the problem started, and should be accurate to within 5 minutes of the true problem start time. If the trace date is known to that accuracy, then enter it. Otherwise, leave it blank, and the QA staff can research and enter the trace date.
7. *Sensor Problem*: If the problem is due to a fault with the equipment or sensor, select *Yes* (e.g., damaged sensor or radio that is not transmitting). If the problem is not due to a fault with the equipment or sensor itself but is associated with working equipment or sensor, select *No* (e.g.,

missing equipment that needs to be installed or working equipment that needs to be removed from a site).

8. *Reporter*: The reporter is the person who first noticed and reported the problem. Select that person's affiliation and username.
9. *Network*: Select the network in which the site is located (e.g., select "COOPNE" for a site in New England).
10. *Site*: Select the ID of the site with the problem.
11. *Eqtype*: Select the equipment type of the equipment or sensor with the problem.
12. *Parameter*: Select the parameter with the problem. If a sensor, this is the measured parameter in the rawest form that is affected by the problem (e.g., if a precipitation gauge vibrating wire is broken, choose VWFRQx, where x is the wire number; the problem also affects VWPCPx, but since VWPCPx is derived from VWFRQx, it automatically follows that the problem affects VWPCPx, too). If a non-sensor unit of equipment, there will most often be one choice. If that equipment type can be installed in more than one way at a site (e.g., primary [VREG] vs. secondary [VREGS] voltage regulator), there will be multiple choices.
13. Note that the *Priority* and *Date Fix By* fields are completed automatically based on the *Parameter* and are not editable.
14. *Problem Description*: Describe the problem as specifically as possible and provide all details that might be pertinent and help in diagnosis.
15. Click the *Insert* button. The ticket will either be inserted successfully, or if there is an equipment location inconsistency, an error message will appear. If unable to resolve the error, contact a QA Manager by email or phone.

B.8 Entering a Trouble Ticket Fix

1. Click on the *Ticket* menu and select *Insert Fix*.
2. In the window that appears, enter the trouble ticket number of the ticket fixed or select the number from the list of open tickets on the right.
3. Click *Proceed to Insert Fix*. The fix insertion page will appear.
4. *Date Submitted* field: This field is automatically completed with the current date and time; leave it as entered.
5. *Date Entered* field: This field is automatically completed with the current date and time; leave it as entered.
6. *Entered By*: In the left-hand drop-down menu, select your affiliation. In the right-hand drop-down menu, select your username.
7. *Fixed By*: Select the affiliation and username of the person who primarily fixed the problem.
8. *Dt. Fixed*: Enter the date and time the problem was fixed. Usually, entering the site visit departure time is the best time to enter. All dates must be entered using one of the two following formats: DD-MMM-YYYY hh:mm or YYYY-MM-DD hh:mm, where MMM is the first three letters of the month, and MM is the number of the month. (e.g., 01 for January, 07 for July, etc.).
9. *Action Taken*: Refer to Table B-1 below to determine the best selection.

Table B-1. Trouble ticket fix action taken categories and explanations.

Action Taken	Description	Serial Numbers Required
INITIAL INSTALL	If this is either the first time the equipment has been installed at the site or if installing equipment that had been removed from the site during a previous visit (if installing equipment that is removed during the same visit, use the REPLACED action taken).	New
NO ACTION TAKEN	If no problems were found with the equipment and no corrective action was taken with the equipment for which the ticket was issued. If the problem was actually caused by a different unit of equipment, enter NO ACTION TAKEN for this ticket and insert a separate problem and fix for the equipment actually fixed.	None
OSR	On-Site Repair: Use if there was a problem with the equipment listed on the ticket but fixing it did not require replacement with a new unit of equipment (e.g, fixing a configuration problem, repairing a cable, or replacing a component inside the unit).	Old
REMOVE	Removed the equipment listed on the ticket but did not replace it with a new unit.	Old
REPLACED	Replaced the old unit of equipment with a new unit of equipment.	Old and New
OSR NO SERNO	On-Site Repair, No Serial Number: Use if the unit of equipment is not tracked in the database by serial number (i.e., PRECIP_HEATER, DOOR_SWITCH, PRECIP_TEMP, SITE, FAN). Avoid using this action type for equipment that is tracked in the database by serial number; it will prevent users from tracking all problems that a specific unit of equipment has had, which could help to remove a chronically faulty unit of equipment from inventory.	None

10. *Old Serno, New Serno*: Based on the *Action Taken* selected, the old serial number, new serial number, both, or neither will be required, as indicated in Table B-1. Enter all equipment serial numbers required.
11. *Select Parameter*: If the *Action Taken* is either *INITIAL INSTALL* or *REPLACED*, the affected parameter(s) must be selected. Select all parameters that apply to the unit of equipment or sensor installed.
12. *Fix Description*: Describe the fix as specifically as possible. Include any additional diagnostic information and the specific actions taken to fix the problem. Word the fix description to help other technicians who encounter a similar problem in resolving it and to aid calibration lab and repair technicians in repairing a unit of equipment or sensor returned from the field for repair. If

a sensor was replaced because it was at or near its rotation time, indicate “sensor rotation – no known problems” in the fix description.

13. Click the *Insert* button. The ticket will either be inserted successfully, or if there is an equipment location inconsistency, an error message will appear. If unable to resolve the error, contact a QA Manager by email or phone.

B.9 Entering Calibration Coefficients

1. Click on the *Equipment* menu and select *Search*. The equipment search screen will appear.
2. Enter the sensor’s serial number in the *Serno* field.
3. Select the sensor’s equipment type from the *Eqtype* list.
4. Click the *Search* button. If the serial number and equipment type were entered correctly and the sensor is entered in the database, it will be listed in the results box at the bottom of the window.
5. Click on the sensor’s entry in the results window to bring up a window with the metadata on that sensor.
6. Click on the *Coefficient* tab in the middle right of the window.
7. Click the *Insert Coefficient* link in the coefficient history window that appears. A coefficient entry pop-up window will appear.
8. *Entered By*: Select your affiliation in the left-hand drop-down menu and select your username in the right-hand drop-down menu.
9. *Date Time*: Enter the date and time that the calibration was completed. All dates must be entered using one of the two following formats: DD-MMM-YYYY hh:mm or YYYY-MM-DD hh:mm, where MMM is the first three letters of the month, and MM is the number of the month. (e.g., 01 for January, 07 for July, etc.).
10. *Comment*: Enter any pertinent comments about the calibration, such as the lab that performed it, and the method used.
11. Coefficient fields: The window will include coefficient fields specific to the equipment type of the sensor. Enter the new coefficients, using scientific notation (i.e., $x.xx\text{e}\pm x$), if desired.
12. Click the *Insert* button.

B.10 Tracking Problems

It is possible to track problems by any of a number of search criteria. For example, one could search for all problems with a given parameter (sensor or equipment type) at a given site to look for a pattern of problems specific to that site. Alternatively, a calibration lab technician could search for all problems associated with a specific sensor by serial number at all sites at which it has ever been installed to look for a pattern of problems specific to that sensor.

1. Click on the *Ticket* menu at the top of the window and select *Search*.
2. Enter all desired search criteria and click the *Search* button. A list of all trouble tickets meeting the search criteria will appear at the bottom of the window. If the list is expected to be long, click the *Output in New Window* check box before clicking the *Search* button.

3. The tickets can be sorted by up to three orders of criteria using the three sort drop-down menus at the top of the results box or window. Select the sort criteria and click the *Sort* button to sort. For example, technicians can sort trouble tickets by priority and fix due date to list them in order of priority to fix. To do this, select Fix Due By in the first drop-down menu, select Priority in the second drop-down menu, and click Sort. The list will be sorted first by fix due date and by priority within identical fix due dates.

B.11 Printing Open Trouble Tickets

Each technician should print all open trouble tickets for his/her area of responsibility to take into the field. The paper tickets provide a way to keep track of all open tickets and include spaces to fill in all required fix information as the fix is completed. The completed paper tickets will then be used to enter the trouble ticket fixes into the database upon return from the field.

1. Click on the *Ticket* menu at the top of the window and select *Search*.
2. In the *Fixed* drop-down menu, select *No*.
3. In the *Site Owner* drop-down, select your username.
4. Check the *Output in New Window* check box.
5. Click the *Search* button. A list of all open trouble tickets at sites for which you are listed as the primary technician will appear in a new window.
6. Sort the list if desired. Sorting with Fix Due By as the primary criterion (left-most drop-down menu) and Priority as the secondary criterion (second from the left drop-down menu) is recommended.
7. To print a copy of each open ticket, click on the number of the ticket to print. The ticket details will appear.
8. Click the *Print Preview* link at the top right corner. The printable ticket will open in a new window.
9. Click *Print* at the top right corner to print the ticket.
10. Close the print preview window and click the back arrow button in the ticket detail window to return to the sort results list.
11. Repeat Steps 7 through 10 for each trouble ticket to be printed.

B.12 Tracking Residence Times

1. Click on the *Equipment* menu at the top of the page and select *Search*.
2. Select the sensor or equipment of interest from the *Eqtype* drop-down menu.
3. Click on the *Residence Time* tab below the search criteria.
4. Select the technician or network and a specific site or *All Sites*.
5. Click the *Search* button.

B.13 Tracking Equipment Locations

1. Click on the *Equipment* menu at the top of the page and select *Search*.
2. Enter all desired search criteria.
3. Click on the *Location* tab below the search criteria and enter any additional search criteria desired.
4. Click the *Search* button.

Appendix C. Site Visit Form

The NERON Site Visit Form is used in the field to document site visit information. The site visit information must then be entered into the database upon return from the field.

NERON SITE VISIT FORM

STATION ID	TECHNICIAN(S)	TECHNICIAN AFFILIATION	
UTC DATE ARRIVE	UTC TIME ARRIVE	UTC DATE DEPART	UTC TIME DEPART

Visit Type:

EQUIP.	INSPECTED?	ABNORMALITY?	EQUIP.	INSPECTED?	ABNORMALITY?	EQUIP.	INSPECTED?	ABNORMALITY?
Mast/Tower	<input type="checkbox"/>	<input type="checkbox"/>	Sensors	<input type="checkbox"/>	<input type="checkbox"/>	Terrain	<input type="checkbox"/>	<input type="checkbox"/>
Enclosures	<input type="checkbox"/>	<input type="checkbox"/>	PRECIP	<input type="checkbox"/>	<input type="checkbox"/>	Vegetation	<input type="checkbox"/>	<input type="checkbox"/>
Radn Shield	<input type="checkbox"/>	<input type="checkbox"/>	Cables	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>

CLEANING	CLEAN ON ARRIVAL	CLEANED	CLEANING/LEVELING	CLEAN ON ARRIVAL	CLEANED	LEVEL ON ARRIVAL	LEVELED	RF POWER	FWD	REF
Radn Shield	<input type="checkbox"/>	<input type="checkbox"/>	PRECIP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Arrival		
Solar Panel(s)	<input type="checkbox"/>	<input type="checkbox"/>	SRAD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Departure		

☐ Vegetation cut to 3-inch height or less (submit required photographic documentation)☐ Desiccant replaced☐ Emptied precipitation gauge (complete boxes immediately below)

PRECIP ANTIFREEZE ADDED?	TYPE OF ANTIFREEZE	AMOUNT OF ANTIFREEZE	AMOUNT OF H ₂ O MIXED W/ANTIFREEZE
<input type="checkbox"/>		L Qt.	L Qt.

☐ Verified precipitation gauge calibration (complete boxes at right) →
☐ Calibrated precipitation gauge (submit completed calibration sheet and OSR trouble ticket; required if, during calibration verification, any single vibrating wire difference exceeds $\pm 3\%$ or if the difference of the average of the three exceeds $\pm 2\%$)
☐ Precipitation gauge calibration forms completed☐ Uploaded new logger OS/firmware (complete leftmost box below)☐ Uploaded new logger program/setup (complete rightmost two boxes below)

LOGGER SERIAL NUMBER	LOGGER OS/FIRMWARE VERSION	LOGGER PROGRAM/SETUP NAME

CAL VERIF	PRECIP S/N:		
	SER. NO.	Depth (mm)	% Diff.
VWPCP1			-100.0
VWPCP2			-100.0
VWPCP3			-100.0
Avg.		0.0	-100.0

Documentation Submitted to NERON QA Manager☐ This site visit form☐ Trouble ticket(s)☐ Photos☐ GEONOR Calibration Forms☐ Any data collected from logger FTPed to NERON Operations and Monitoring System

Notes:

Appendix D. Site Visit Data Verification Form

(TO BE INSERTED)

Appendix E. Trouble Ticket Form

The NERON Trouble Ticket Form is used in the field to document trouble ticket problems and fixes. The site visit information must then be entered into the database upon return from the field.

NERON TROUBLE TICKET FORM

STATION ID	REPORTER	REPORTER AFFILIATION	
DATE PROB NOTICED	DATE PROB TRACED	SENSOR PROBLEM?	

PRIORITY 4 10 BUSINESS DAYS					PRIORITY 6 20 BUSINESS DAYS			
<input type="checkbox"/> TAIR1	<input type="checkbox"/> PRECIP	<input type="checkbox"/> RADIO	<input type="checkbox"/> BATV	<input type="checkbox"/> SOLRP	<input type="checkbox"/> WSPD	<input type="checkbox"/> SRAD	<input type="checkbox"/> TS05	<input type="checkbox"/> VW05
<input type="checkbox"/> TAIR2	<input type="checkbox"/> VWPCP1	<input type="checkbox"/> GPSANT	<input type="checkbox"/> BATVS	<input type="checkbox"/> SOLRPS	<input type="checkbox"/> WDIR	<input type="checkbox"/> PRES	<input type="checkbox"/> TS10	<input type="checkbox"/> VW10
<input type="checkbox"/> TAIR3	<input type="checkbox"/> VWPCP2	<input type="checkbox"/> RS232IF	<input type="checkbox"/> VREG	<input type="checkbox"/> ACTRAN	<input type="checkbox"/> WS2M	<input type="checkbox"/> RELH	<input type="checkbox"/> TS20	<input type="checkbox"/> VW20
<input type="checkbox"/> LOGG	<input type="checkbox"/> VWPCP3	<input type="checkbox"/> FLDOOR	<input type="checkbox"/> VREGS	<input type="checkbox"/> BATCHG	<input type="checkbox"/> FANSP1	<input type="checkbox"/> DEWPNT	<input type="checkbox"/> TS35	<input type="checkbox"/> VW35
<input type="checkbox"/> WET1,2	<input type="checkbox"/> BUCKET	<input type="checkbox"/> FANSP1&2			<input type="checkbox"/> FANSP2	<input type="checkbox"/> WTRVAP	<input type="checkbox"/> TS50	<input type="checkbox"/> VW50

PRIORITY 9 30 BUS. DAYS	<input type="checkbox"/> WIRPAN	<input type="checkbox"/> MUX	<input type="checkbox"/> ETHHUB	<input type="checkbox"/> SERADS	<input type="checkbox"/> PDA	<input type="checkbox"/> TPS	<input type="checkbox"/> TPRECIP	<input type="checkbox"/> TSLO
	<input type="checkbox"/> PRTMOD	<input type="checkbox"/> SERSRV	<input type="checkbox"/> ROUTER	<input type="checkbox"/> SERADH	<input type="checkbox"/> UPS	<input type="checkbox"/> SRGSUP	<input type="checkbox"/> FLPHTR	

Description of Problem:	
	Priority Fix Due By

Entered by:	Date:	Ticket #:	QP Updated: <input type="checkbox"/>
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UTC DATE FIXED	UTC TIME FIXED	TECHNICIAN(S)	TECHNICIAN AFFILIATION

Fix Type (Choose One)

OLD SN (Required for OSR, RPL, RMV)_____
NEW SN (Required for RPL, INI)

Description of Fix:

Operator: _____ contacted (for TAIR, PRECIP, VWPCP, SRAD, and SOILMOIST) Time: _____

Entered by:	Date:	Loc Updated: <input type="checkbox"/>	QP Updated: <input type="checkbox"/>
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Appendix F. Trouble Ticket Form for Mass Installs, Fixes, or Moves

The NERON Trouble Ticket Form for Mass Installs Fixes or Moves is used in the field to document multiple installations, trouble ticket fixes, or removals of equipment at the same site during a single visit. Each fix must then be entered into the database individually upon return from the field.

NERON TROUBLE-TICKET FORM FOR MASS INSTALLS, FIXES, OR REMOVALS

STATION ID	STATION TYPE <input type="text"/>	UTC DATE ARRIVE	UTC TIME ARRIVE	UTC DATE DEPART	UTC TIME DEPART
TECHNICIAN(S)			AFFILIATION	ENTERED BY	DATABASE ENTRY DATE
DESCRIPTION OF PROBLEM					

Equip ID	Old SN	New SN	Description of Fix: (Include OSR, RPL, INI, RMV, NAT)	DB T-Tkt No. Updated
LOGG			<input type="checkbox"/>	<input type="checkbox"/>
WIRPAN			<input type="checkbox"/>	<input type="checkbox"/>
PRTMOD			<input type="checkbox"/>	<input type="checkbox"/>
RADIO			<input type="checkbox"/>	<input type="checkbox"/>
GPSANT			<input type="checkbox"/>	<input type="checkbox"/>
RS232IF			<input type="checkbox"/>	<input type="checkbox"/>
SERSRV			<input type="checkbox"/>	<input type="checkbox"/>
ETHHUB			<input type="checkbox"/>	<input type="checkbox"/>
ROUTER			<input type="checkbox"/>	<input type="checkbox"/>
SERADS			<input type="checkbox"/>	<input type="checkbox"/>
SERADH			<input type="checkbox"/>	<input type="checkbox"/>
PDA			<input type="checkbox"/>	<input type="checkbox"/>
SOLRP			<input type="checkbox"/>	<input type="checkbox"/>
SOLRPS			<input type="checkbox"/>	<input type="checkbox"/>
ACTRAN			<input type="checkbox"/>	<input type="checkbox"/>
UPS			<input type="checkbox"/>	<input type="checkbox"/>
TPS			<input type="checkbox"/>	<input type="checkbox"/>
VREG			<input type="checkbox"/>	<input type="checkbox"/>
VREGS			<input type="checkbox"/>	<input type="checkbox"/>
BATCHG			<input type="checkbox"/>	<input type="checkbox"/>
BATV			<input type="checkbox"/>	<input type="checkbox"/>
BATV			<input type="checkbox"/>	<input type="checkbox"/>
BATV			<input type="checkbox"/>	<input type="checkbox"/>
BATV			<input type="checkbox"/>	<input type="checkbox"/>
BATVS			<input type="checkbox"/>	<input type="checkbox"/>
BATVS			<input type="checkbox"/>	<input type="checkbox"/>
BATVS			<input type="checkbox"/>	<input type="checkbox"/>
BATVS			<input type="checkbox"/>	<input type="checkbox"/>

Equip ID	Old SN	New SN	Description of Fix: (Include OSR, RPL, INI, RMV, NAT)	DB
				T-Tkt No. Updated
TAIR1			<input type="checkbox"/>	<input type="checkbox"/>
TAIR2			<input type="checkbox"/>	<input type="checkbox"/>
TAIR3			<input type="checkbox"/>	<input type="checkbox"/>
PRECIP			<input type="checkbox"/>	<input type="checkbox"/>
BUCKET			<input type="checkbox"/>	<input type="checkbox"/>
VWPCP1			<input type="checkbox"/>	<input type="checkbox"/>
VWPCP2			<input type="checkbox"/>	<input type="checkbox"/>
VWPCP3			<input type="checkbox"/>	<input type="checkbox"/>
WET1,2			<input type="checkbox"/>	<input type="checkbox"/>
WSPD			<input type="checkbox"/>	<input type="checkbox"/>
WDIR			<input type="checkbox"/>	<input type="checkbox"/>
TPRECP			<input type="checkbox"/>	<input type="checkbox"/>
FLPHTR			<input type="checkbox"/>	<input type="checkbox"/>
FLDOOR			<input type="checkbox"/>	<input type="checkbox"/>
FANSP1			<input type="checkbox"/>	<input type="checkbox"/>
FANSP2			<input type="checkbox"/>	<input type="checkbox"/>

Appendix G. Metadata Form

The metadata form should be used to report initial installations and moves of stations, as well as any changes in station metadata beyond maintenance and equipment changes accounted for in the maintenance and trouble ticket forms.

The following is an explanation of how to enter information in all sections of the metadata form.

G.1 Header

The header should be filled out completely any time the metadata form is used. If an update, enter only the information that has changed in the sections after the header.

- Select the form type in the drop-down menu at the top. Select the “Initial Installation” box if this is the first time the station is being installed. Select the “Move” box if an existing station is being moved to a new location nearby. Select the “Update” box if metadata is being updated for an existing station that is not being moved.
- Enter the 5-character station ID, the full station name, and circle the station type (REMO for a remote weather station, RPTR for a communication repeater, or BASE for a communication base station).
- Enter the effective date and time of the change in coordinated universal time (UTC). In the case of an installation or move, this is the time that the installation or move is totally complete and the station has been verified operational.

G.2 Site Information

- Enter the latitude and longitude, as measured from the center of the site plot, using a GPS receiver with Wide-Area Augmentation System (WAAS) or differential capability, *in fractional degrees to 5 decimal places*. Enter the elevation, as measured by the same GPS receiver. Take a photo of the GPS display, formatted as described in the Site Installation Plan Photographic Documentation section.
- Enter the manufacturer and model number of the GPS used to determine latitude and longitude in the “LAT/LON SOURCE” box and the manufacturer and model number of the device used to determine the elevation in the “ELEV SOURCE” box. If a single GPS receiver is used for both lat/lon and elevation, enter the same information in both boxes. Enter the horizontal and vertical coordinate reference datums used by the GPS. The horizontal reference datum used must be NAD83 (North American Datum of 1983) or later, and the vertical reference datum used must be NAVD88 (North American Vertical Datum of 1988) or later. It is important to note the datum used, because errors of up to 150 feet can be introduced by assuming the wrong datum.
- Enter the offset of local standard time from Coordinated Universal Time (UTC), the magnetic declination (the number of degrees that a compass needle points east or west of true north; be sure to include “W” or “E,” as appropriate, after the number).
- Enter the state, county, climate division, the three-letter ID of the weather forecast office (WFO) in whose county warning area (CWA) the site is located, and the government property ID (if applicable).

- Circle the plot size, indicate whether a fence is installed around the perimeter of the plot, describe the type of fence, indicate whether the station is solar- or AC-powered, whether an enclosure heater is installed, and enter the number of ground rods, ground plates, and/or grounding mesh matrices installed.

G.3 Site Contact and Site Host Info

Enter as much of the contact information as possible, so that the site contact – and site host, if different from the contact – can be contacted easily. The site host is the person who actually owns or manages the property.

G.4 Equipment Information

Enter site-specific information about the installed equipment. In the top row, select the site power source, if a logger enclosure heater is installed, and the number of each type of ground installed.

- **PRECIP.** Enter the height of the precipitation gauge’s inlet above the ground in either centimeters or inches, the type of mounting foundation, whether or not antifreeze was added, if a weighing bucket gauge, and the type and amount of antifreeze, if added.
- **LOGG.** Enter the logger serial number, operating system or firmware version, the program or setup name, and the logger’s PakBus address, if a Campbell Scientific logger.
- **LETS RADIO.** Enter the frequency (or band of frequencies, in the case of a spread spectrum radio) at which the radio operates in MHz, the RF ID assigned to the station, the ID of the station’s RF subnet, if applicable, and the ID of the primary base station with which the site will communicate.
- **GOES RADIO.** Enter the NESDIS ID, the baud rate, the channel indicated on the NESDIS assignment sheet in the “GOES NESDIS CHANNEL” box, the channel actually entered in the transmitter configuration (which is roughly half the value of the NESDIS channel for many transmitters for 1200 baud channels) in the “GOES TXER CHANNEL” box, the transmit time of the first transmission of the day in seconds past midnight UTC (the number shown on the NESDIS assignment sheet is given in minutes and seconds and must be converted to seconds), the transmit window in seconds, and the interval between transmissions in seconds.
- **RADIO.** Enter the antenna height above ground level in meters or feet, select the type of antenna installed, the antenna gain in dBi or dBd, the true azimuth toward which the antenna is oriented, and the inclination relative to horizontal of the antenna if a GOES system.
- **SOLRP(S).** Enter the inclination of the solar panels (the direction the face of the panel is oriented) relative to horizontal.

Indicate if AC MAINS power is available within 300 feet of the site, if not already MAINS-powered, and document the direction, distance, and intervening terrain between the tower and the MAINS power source. Include photos, soil type, the presence of rocks, or anything else that will impact trenching for the MAINS line.

G.5 Site Access

- Check the “Yes” box if National Weather Service and National Weather Service contractors will have unrestricted access to the site at all times, if “No”, explain all restrictions in the text box.

- If there will be a locked gate or door controlling access to the station, circle “Y” in the “Locked Gate?” box, “N” otherwise. If the site host will allow NWS to daisy chain its own lock at the gate or door, circle “Y” in the “NWS Lock Allowed?” box, “N” otherwise. If an NWS lock has actually been installed at the gate or door, check “Y” in the “NWS Lock Installed?” box, “N” otherwise. If there is a non-NWS key lock, enter the number of keys acquired for NWS and NWS contractor use. If there is a gate or door with a key lock, NWS or not, enter the key number or ID. If there is a combination lock, enter the combination.
- Indicate whether the LETS agencies will require identification to enter any of their premises (e.g., local PD, state highway patrol office, etc.)
- Indicate whether 2-wheel-drive vehicles and 4-wheel-drive vehicles will be able to drive to the site throughout the year, and if not, explain why not and when access will or will not be possible in the text box for both 2WD and 4WD.
- Indicate whether the site host prefers not to have vehicles driven off-road under any conditions or has any restrictions on the route driven to the site, and explain all preferences and restrictions in detail.

G.6 Site Driving Directions

Describe how to drive to the site from a nearby intersection of two US/state highways or from an interstate highway exit. Include the distance driven to each turning or end point in tenths of a mile.

G.7 Site Host Special Instructions

Indicate how the site host prefers that maintainers dispose of grass cuttings from the site plot and describe any other special instructions that the site host has for anyone who might visit the station.

G.8 Notes

Take notes of any pertinent information that is not covered elsewhere in the form, which would have an effect on sensor exposure, station operation, or anyone visiting the site.

NERON REMOTE STATION METADATA FORMForm Type: (Enter only changed information after first two lines for Update)

STATION ID	STATION NAME	STATION SUB-CLASS <input type="text"/>	UTC DATE EFFECTIVE	UTC TIME EFFECTIVE
TECHNICIAN NAME(S)		TECHNICIAN AFFILIATION		

SITE INFORMATION

SITE OPERATED BY ("NWS" OR PARTNER MESONET NAME)			UTC OFFSET (STD TIME)	MAGNETIC DECLINATION ° <input type="text"/>
LATITUDE (DEG, TO 5 DECIMAL PLACES) °	LONGITUDE (DEG, TO 5 DECIMAL PLACES) °	ELEVATION m	GPS SIGNAL AUGMENTATION <input type="text"/>	
LAT/LON SOURCE	ELEV SOURCE	HORIZ. COORDINATE REF DATUM	VERT. COORDINATE REF DATUM	
NEAREST CITY	STATE	GOV'T PROPERTY ID	PLOT SIZE <input type="text"/>	
TOWER FOUNDATION TYPE <input type="text"/>	GUY WIRE ANCHOR TYPE <input type="text"/>	FENCE INSTALLED? <input type="text"/>	FENCE TYPE	

SITE CONTACT INFO

NAME		TYPE	
ADDRESS			
CITY		STATE	ZIP
PHONE	FAX	EMAIL	

SITE HOST INFO (If different from site contact)

NAME		TYPE	
ADDRESS			
CITY		STATE	ZIP
PHONE	FAX	EMAIL	

SITE PHOTOSBEFORE INSTALLATIONSite outward-looking photos taken? ----- ☐GPS photo taken? ----- ☐

Optional: record photo number in appropriate box

SO_N (toward N)	SO_NE (toward NE)	SO_E (toward E)	SO_SE (toward SE)	SO_S (toward S)	SO_SW (toward SW)	SO_W (toward W)	SO_NW (toward NW)
GPS <input type="text"/>							

DURING INSTALLATIONTower/mast/precipitation anchor/foundation hole photos taken? ----- ☐AC power trench photo taken? ----- ☐Soil moisture sensor hole photos taken? ----- ☐Configuration deviation or notable finding photos taken? ----- ☐

Optional: record photo number in appropriate box

HTF	HPF	HSF		
ACT				
HSM05	HSM10	HSM20	HSM35	HSM50

WHEN INSTALLATION COMPLETESite inward-looking photos taken? ----- ☐Cover shot taken? ----- ☐Tower/mast/precipitation anchor/foundation photo taken? ----- ☐Soil moisture plot photos taken? ----- ☐

Optional: record photo number in appropriate box

SI_N (toward N)	SI_E (toward E)	SI_S (toward S)	SI_W (toward W)	
TF	PF	SF		
SM05	SM10	SM20	SM35	SM50

All installaion photos uploaded? ----- ☐**SITE DESCRIPTION**

Describe the use of the property and surrounding area (i.e., pasture land used for grazing, grow wheat/barley/soy which is cut once/twice a year, tilled fields, etc.):

Describe terrain (360 degrees) - long distance (miles) and nearer (~300-600 meters) (i.e., rolling hills, steep escarpments, relatively flat, distance/direction to nearest town and size of town, etc.):

Site obstruction drawing completed? ----- ☐Site obstruction drawing scanned and uploaded? ----- ☐**EQUIPMENT INFORMATION**

POWER TYPE	LOGGER ENCLOSURE HEATER INSTALLED?	NO. OF GROUND RODS	NO. OF GROUND PLATES	NO. OF MESH GROUND POINTS
<input type="checkbox"/>	<input type="checkbox"/>			

PRECIP	HT OF INLET cm	TYPE OF FOUNDATION				
	ANTIFREEZE ADDED?	TYPE OF ANTIFREEZE	AMOUNT OF ANTIFREEZE L			
LOGG	SERIAL NUMBER	OS/FIRMWARE VERSION	PROGRAM/SETUP NAME			PAKBUS ID (CSI ONLY)
LETS RADIO	LETS FREQUENCY/BAND (MHz) MHz	LETS RF ID	LETS SUBNET ID	LETS PRIMARY BASE ID		
GOES RADIO	GOES NESDIS ID	GOES BAUD	GOES NESDIS CHANNEL	GOES TXER CHANNEL	GOES TX TIME s	
	GOES WINDOW s	GOES INTERVAL s				
RADIO	ANTENNA HEIGHT m	ANTENNA TYPE	ANTENNA GAIN dBi	ANTENNA AZIMUTH ° True	ANTENNA INCLINATION (HORIZONTAL = 0) °	
SOLRP(S)	TILT (AIMED AT HORIZON = 90) °					

If site not already AC-powered, is AC power available within approximately 300 ft? ----- ☐

If yes, document direction, distance, and intervening terrain between tower and AC power source, include photos, type soil, rocks, etc. that will impact trenching AC line.

Mass install form completed? ----- ☐

Mass install form uploaded? ----- ☐

As-built drawing completed? ----- ☐

As-built drawing scanned and uploaded? ----- ☐

Precip gauge calibrated? ----- ☐

Precip gauge calibration sheet completed? ----- ☐

Precip gauge calibration sheet uploaded? ----- ☐

SITE HOST QUESTIONS

Is there active tilling of fields within 500 yards of the site? ----- ☐

Is there active irrigation of fields within 500 yards of the site? ----- ☐

If a fence has not already been installed, will one be required? ----- ☐

Will the host augment with manual data (i.e., snowfall, snow depth, river stage, etc.)? ----- ☐

If not already installed, will host allow a 33-ft tower for a wind sensor some day? ----- ☐

If yes to above question, would host allow guy wires to support the tower? ----- ☐

How does the host prefer that vegetation cuttings be disposed of? ----- ☐

Other host special instructions:

SITE ACCESSMust site host be notified (in person, if possible) prior to each maintenance visit? ----- ☐Will NWS and NWS contractors have unrestricted access to the site and be able to work late and on weekends? ----- ☐

LOCKED GATE?	NWS LOCK ALLOWED?	NWS LOCK INSTALLED?	NO. OF KEYS ACQUIRED	KEY NUMBER/ID	LOCK COMBO (IF APPLICABLE)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			

List any site access restrictions that will be in place below:

Vehicle access to the site throughout the year: ----- ☐

If 2WD access not available throughout the year, explain below:

Does the site host prefer not to have vehicles driven off-road under certain conditions or have any restrictions on the route that is driven to the site on the host's land? ----- ☐

If so, explain below:

SITE DRIVING DIRECTIONS

(From the intersection of two US/state highways or from an interstate highway exit to the site. Include segment distances precise to the tenth of a mile)

NOTES

Appendix H. Obstruction Drawing

NERON OBSTRUCTION DRAWING

(Use only **BLACK INK** to facilitate scanning)

Draw each obstruction within 100 meters (330 feet) of the center of the plot, label its bearing from the center of the plot in degrees relative to true north, its angular height, and its distance from the center of the plot in meters below. The center of the circle below indicates the center of the plot and the edge of the circle represents the extent of the 100-meter range. Each range ring indicates 25 meters (82.5 ft.). In addition, label the locations of other significant terrain features that could affect instrument measurements, such as roads, parking lots, concrete slabs, and bodies of water.

STATION ID	DATE	TECHNICIAN NAME(S)	TECHNICIAN AFFILIATION

